

Amendments to the Drawings:

Enclosed herewith is an amended version of Figure 8, in which the line thickness of the cross-hatching of material 590 has been increased in accordance with the Examiner's suggestion. In accordance with the Office's revised format, this drawing has been labeled "Replacement Sheet."

REMARKS

Claims 1-17 and 19-45 are presently pending in this application. No claims have been amended or cancelled in this response.

In the Office Action mailed February 24, 2006, claims 1-3, 5, 6, 8-12, 14-17, 19, 20, 22-24, 28, 29, 41 and 43-45 were rejected. More specifically, the status of the application in light of this Office Action is as follows:

- (A) The drawings were objected to because of an informality;
- (B) Claims 1, 3, 5, 6, 8-10, 12, 14-17, 19, 20, 22-24, 28, 29, 41, 43 and 44 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese Patent Publication No. 2000323517 to Ihara ("Ihara") in view of Japanese Patent Publication No. 361014817 to Tominaga ("Tominaga");
- (C) Claims 2 and 11 were rejected under 35 U.S.C. § 103(a) as being patentable over Ihara and Tominaga in view of U.S. Patent No. 6,784,394 to Nishiura ("Nishiura");
- (D) Claim 45 was rejected under 35 U.S.C. § 103(a) as being patentable over Ihara and Tominaga in view of U.S. Patent No. 3,553,417 to Smith et al. ("Smith");
- (E) Claims 4, 7, 13, 21, 25-27 and 42 were objected to as being dependent upon a rejected base claim, but were indicated to be allowable if rewritten in independent form to include the features of the claims from which they depend; and
- (F) Claims 30-40 were allowed.

The undersigned attorney wishes to thank the Examiner for engaging in a telephone conference on May 9, 2006, and requests that this paper constitute the Applicants' Interview Summary. During the telephone conference, the present Office Action, applied art, and pending claims were discussed. The following remarks summarize and expand upon the points discussed during the telephone conference.

A. Response to the Section 103(a) Rejection over Ihara and Tominaga

Claims 1, 3, 5, 6, 8-10, 12, 14-17, 19, 20, 22-24, 28, 29, 41, 43 and 44 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ihara and Tominaga. For the reasons described below, the cited references fail to disclose or suggest all the features of these claims.

1. Claim 1 is Directed to a Method of Wire-Bonding Including Severing a Wire with an Electrical Discharge Between First and Second Electrodes

Claim 1 is directed to a method of wire-bonding including positioning a first electrode and a second electrode at least proximate to a wire attached to a terminal of a microelectronic component and severing the wire with an electrical discharge between the first and second electrodes.

2. Ihara Discloses an Electric Flame Off for Cutting Wire and Forming a Ball at the End of the Wire

Ihara discloses an electric flame off for cutting wire. The electric flame off includes a single conductor that generates spark discharge energy to cut the wire and form a ball at the end of the wire so that the ball can be bonded to an electrode of a semiconductor chip.

3. Tominaga Discloses a Device for Cutting Wire so that the End of the Wire Does Not Have a Burr

Tominaga discloses a wire cutting device including a pair of spark generating electrodes positioned on opposite sides of a wire. The electrodes are specifically configured so that the "cut end portion of the cut wire has no burr." (Tominaga, Constitution.) The shape of the cut end of the wire enables "automatic and smooth insertion of the wire" into a machine. (Tominaga, Purpose.)

4. Ihara and Tominaga Fail to Disclose or Suggest Severing a Wire with an Electrical Discharge Between First and Second Electrodes

Ihara and Tominaga fail to disclose or suggest a method of wire-bonding including, *inter alia*, "severing the wire with an electrical discharge between the first and second electrodes" in which the wire is "attached to a terminal of the microelectronic component," as recited in claim 1. As the Examiner correctly notes, "Ihara does not disclose using two electrode to cut the wire." (Office Action, p. 3.) The Examiner alleges, however, that "[i]t would have been obvious to

adapt Ihara in view of Tominaga" to add Tominaga's second electrode to Ihara's device. (Office Action, p. 4.) Applicants disagree.

One of ordinary skill in the art would not be motivated to modify Ihara's device as suggested by the Examiner because such a modification would destroy one purpose of Ihara's device. Specifically, Ihara discloses a device with a single electrode for cutting wire so that a ball is formed at the end of the wire. The ball enables the wire to be connected to a contact on a semiconductor chip. In contrast, Tominaga discloses a device with two electrodes for cutting wire so that no burr or ball is formed at the end of the wire. The burr-less, ball-less end of the wire enables the wire to be smoothly and automatically inserted into a machine. If Tominaga's second electrode were added to Ihara device as suggested by the Examiner, the modified device may cut the wire so that no burr or ball is formed at the end of the wire. This would thwart one purpose of Ihara invention—to form a ball at the end of the wire for facilitating attachment of the wire to the semiconductor chip. Accordingly, one of ordinary skill in the art would not be motivated to add Tominaga's second electrode to Ihara's device because such a modification would contravene one purpose of Ihara's device.

The law does not allow one reference to be modified to come up with the claimed combination of features when the modification contravenes the object of the invention disclosed in the prior art reference and ignores the portion of the reference that teaches away from making the claimed structure. To meet the burden of establishing a *prima facie* case of obviousness, “the Examiner must show that there is either a suggestion in the art to produce the claimed invention or a compelling motivation based on sound scientific principles.” *Ex parte Kranz*, 19 U.S.P.Q.2d 1216, 1218 (Bd. Pat. App. & Interf. 1991). To show such a suggestion, the Examiner must show that “the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art.” *In re Bell*, 26 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1993). Moreover, and importantly for the present case, a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would teach away from the claimed invention. *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 U.S.P.Q. 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). This same standard is echoed in MPEP § 2142:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure.

The MPEP goes on to explain that if the references do not "expressly or impliedly suggest the claimed invention," it is the Examiner's burden to "present a convincing line of reasoning" as to why the modification would have been obvious. *Id.* (quoting *Ex Parte Clapp*, 227 U.S.P.Q. 972, 973 (Bd. Pat. App. & Inter. 1985)). This line of reasoning must be more than vague conjecture about *possible* modifications of the prior art.

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. . . . Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so."

MPEP § 2143.01 (quoting *In re Mills*, 916 F.2d 680, 16 U.S.P.Q. 2d 1430 (Fed. Cir. 1990)).

The current rejection of claim 1 over the combination of Ihara and Tominaga does not comply with Section 103 because one of ordinary skill in the art would not be motivated to add Tominaga's second electrode to Ihara's device. As explained above, such a modification would contravene an object of Ihara's invention. Accordingly, the Section 103 rejection of claim 1 should be withdrawn.

Claims 3, 5, 6, 8 and 9 depend from claim 1. Accordingly, the Section 103(a) rejection of these claims should be withdrawn for at least the reasons discussed above with reference to claim 1 and for the additional features of these claims.

Independent claim 10 has, *inter alia*, features generally analogous to those included in claim 1. Accordingly, the Section 103(a) rejection of claim 10 should be withdrawn for at least

the reasons discussed above with reference to claim 1 and for the additional features of this claim.

Claims 12 and 14-17 depend from claim 10. Accordingly, the Section 103(a) rejection of these claims should be withdrawn for at least the reasons discussed above with reference to claim 10 and for the additional features of these claims.

Independent claims 19 and 20 have, *inter alia*, features generally analogous to those included in claim 1. Accordingly, the Section 103(a) rejection of claims 19 and 20 should be withdrawn for at least the reasons discussed above with reference to claim 1 and for the additional features of these claims.

Claim 22 depends from claim 19. Accordingly, the Section 103(a) rejection of claim 22 should be withdrawn for the reasons discussed above with reference to claim 19 and for the additional features of this claim.

Independent claims 23 and 24 have, *inter alia*, features generally analogous to those included in claim 1. Accordingly, the Section 103(a) rejection of claims 23 and 24 should be withdrawn for at least the reasons discussed above with reference to claim 1 and for the additional features of these claims.

Claims 28 and 29 depend from claim 24. Accordingly, the Section 103(a) rejection of these claims should be withdrawn for at least the reasons discussed above with reference to claim 24 and for the additional features of these claims.

Independent claim 41 has, *inter alia*, features generally analogous to those included in claim 1. Accordingly, the Section 103(a) rejection of claim 41 should be withdrawn for the reasons discussed above with reference to claim 1 and for the additional features of this claim.

Claims 43 and 44 depend from claim 41. Accordingly, the Section 103(a) rejection of these claims should be withdrawn for at least the reasons discussed above with reference to claim 41 and for the additional features of these claims.

C. Response to the Section 103(a) Rejection over Ihara, Tominaga, and Nishiura

Claims 2 and 11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ihara, Tominaga, and Nishiura. Claim 2 depends from claim 1; and claim 11 depends from claim 10. Accordingly, claims 2 and 11 are patentable over Ihara and Tominaga for at least the reasons discussed above with reference to their respective independent claims and for the additional features of these dependent claims. Moreover, Nishiura fails cure the above-noted deficiency of Ihara and Tominaga to properly support a *prima facie* case of obviousness. For example, Nishiura fails to provide a motivation to add Tominaga's second electrode to Ihara's device. Accordingly, the Section 103(a) rejection of claims 2 and 11 should be withdrawn.

D. Response to the Section 103(a) Rejection over Ihara, Tominaga, and Smith

Claim 45 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Ihara, Tominaga, and Smith. Claim 45 depends from claim 41. Accordingly, claim 45 is patentable over Ihara and Tominaga for at least the reasons discussed above with reference to claim 41 and for the additional features of this dependent claim. Moreover, Smith fails cure the above-noted deficiency of Ihara and Tominaga to properly support a *prima facie* case of obviousness. For example, Smith fails to provide a motivation to add Tominaga's second electrode to Ihara's device. Accordingly, the Section 103(a) rejection of claim 45 should be withdrawn.

E. Response to Claim Objections

Claims 4, 7, 13, 21, 25-27 and 42 were objected to as being dependent upon a rejected base claim, but were indicated to be allowable if rewritten in independent form to include the features of the claims from which they depend. Claims 4, 7, 13, 21, 25-27 and 42 have not been amended because the Section 103(a) rejection of their respective independent claims should be withdrawn. Accordingly, the objection to claims 4, 7, 13, 21, 25-27 and 42 should be withdrawn.

F. Conclusion

In view of the foregoing, the pending claims comply with 35 U.S.C. § 112 and are patentable over the applied art. The applicants accordingly request reconsideration of the application and a Notice of Allowance. If the Examiner has any questions or believes a

telephone conference would expedite prosecution of this application, the Examiner is encouraged to call David Dutcher at (206) 359-6465.

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Respectfully submitted,

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